BROCADE

Access Gateway

Administrator's Guide

Supporting Fabric OS v5.2.1

Brocade Communications Systems, Incorporated

Corporate Headquarters
Brocade Communications Systems, Inc.
1745 Technology Drive
San Jose, CA 95110
Tel: 1-408-333-8000
Fax: 1-408-333-8101
E-mail: info@brocade.com

Asia-Pacific Headquarters
Brocade Communications Singapore Pte. Ltd.
9 Raffles Place
#59-02 Republic Plaza 1
Singapore 048619
Tel: +65-6538-4700
Fax: +65-6538-0302
Email: apac-info@brocade.com

European and Latin American Headquarters
Brocade Communications Switzerland Sàrl
Centre Swissair
Tour A - 2ème étage
29, Route de l'Aéroport
Case Postale 105
CH-1215 Genève 15
Switzerland
Tel: +41 22 799 56 40
Fax: +41 22 799 56 41
Email: emea-info@brocade.com

Document History

The following table lists all versions of the *Access Gateway Set Up Guide*.

Document Title	Publication Number	Summary of Changes	Publication Date
Access Gateway Administrator's Guide	53-1000430-01	First version	January 2007

Contents

About This Document

Chapter 1   Introduction to the Brocade Access Gateway

Chapter 2   Configuring Access Gateway

Chapter 3   Disabling Access Gateway Mode

Chapter 4   Managing Ports in Access Gateway mode

Appendix A   Default Port Mapping

Appendix B   Compatibility

Appendix C   Troubleshooting

Appendix D   Access Gateway Commands and Messages

Index

About This Document

This document is a procedural guide to help SAN administrators configure and manage Brocade Access Gateway.

Supported hardware and software

This document is specific to Fabric OS v5.2.1 or higher running on the Brocade SilkWorm 4012, 4016, 4020, and 4024 embedded switches.

When procedures or parts of procedures documented here apply to some switches but not to others, this guide identifies which switches are supported and which are not.

This document sometimes mentions other Fabric OS releases to highlight the changes in the latest release or to point out interoperability issues with other SilkWorm models. It also specifies when procedures or steps of procedures apply only to specific SilkWorm models.

Although many different software and hardware configurations are tested and supported by Brocade Communications Systems, Inc. for this Brocade Fabric OS release, documenting all possible configurations and scenarios is beyond the scope of this document.

How this document is organized

The document contains the following topics:

- Chapter 1, "Introduction to the Brocade Access Gateway," describes the Access Gateway operation.
- Chapter 2, "Configuring Access Gateway," provides the initial setup procedures and fabric requirement to deploy an Access Gateway solution.
- Chapter 3, "Disabling Access Gateway Mode," provides instructions on disabling Access Gateway mode so that the switch can be used as a fabric switch.
- Chapter 4, "Managing Ports in Access Gateway mode," provides instructions on changing N_Ports to F_Ports, mapping F_Ports to N_Ports, and changing failover and failback policies.

The appendices provide the default mappings, compatibility guidelines, and troubleshooting assistance.

Document conventions

This section describes text formatting conventions and important notices formats.

Text formatting

The narrative-text formatting conventions that are used in this document are as follows:

bold text	Identifies command names
	Identifies the names of user-manipulated GUI elements
	Identifies keywords and operands
	Identifies text to enter at the GUI or CLI
italic text	Provides emphasis
	Identifies variables
	Identifies paths and Internet addresses
	Identifies document titles
`code` text	Identifies CLI output
	Identifies syntax examples

For readability, command names in the narrative portions of this guide are presented in mixed lettercase: for example, **switchShow**. In actual examples, command lettercase is often all lowercase. Otherwise, this manual specifically notes those cases in which a command is case sensitive. The **ficonCupSet** and **ficonCupShow** commands are an exception to this convention.

Notes, cautions, and warnings

The following notices appear in this document.

Note
A note provides a tip, emphasizes important information, or provides a reference to related information.

Caution
A caution alerts you to potential damage to hardware, firmware, software, or data.

Warning
A warning alerts you to potential danger to personnel.

Key terms

For definitions of SAN-specific terms, visit the Storage Networking Industry Association online dictionary at: *http://www.snia.org/education/dictionary.*

For definitions specific to Brocade and Fibre Channel, see the *Brocade Glossary.*

The following terms are used in this manual to describe Access Gateway mode and its components.

Access Gateway (AG)	Fabric OS mode for embedded switches that reduces SAN (storage area network) deployment complexity by leveraging NPIV (N_Port ID virtualization).
Edge switch	Fabric switch that connects host, storage, or other devices, such as Brocade Access Gateway, to the fabric.
NPIV	N_Port ID virtualization. Allows a single Fibre Channel port to appear as multiple, distinct ports providing separate port identification and security zoning within the fabric for each operating system image as if each operating system image had its own unique physical port.
E_Port	An ISL (InterSwitch link) port. A switch port that connects switches together to form a fabric.
F_Port	A fabric port. A switch port that connects a host, HBA (host bus adaptor), or storage device to the SAN. On Brocade Access Gateway, the F_Port connects to a host only.
N_Port	A node port. A Fibre Channel host or storage port in a fabric or point-to-point connection. On Brocade Access Gateway, the N_Port connects to the edge switch.
mapping	On Brocade Access Gateway, the configuration of F_Port to N_Port routes.

Additional information

This section lists additional Brocade and industry-specific documentation that you might find helpful.

Brocade resources

The most recent version of documentation is provided on the Brocade Web site, through Brocade Connect.

Note

Go to http://www.brocade.com and CLIck **Brocade Connect** to register at no cost for a user ID and password.

The following documentation is available for Fabric OS:

- *Fabric OS v5.2.x Software Addendum*
- *Fabric OS Administrator's Guide*
- *Fabric OS Command Reference*

- *Fabric OS MIB Reference*
- *Fabric OS Message Reference*
- *Web Tools Administrator's Guide*
- *Brocade Glossary*

The following documentation is available for SilkWorm embedded switches:

- *SilkWorm 4016 Hardware Reference Manual*
- *SilkWorm 4016 QuickStart Guide*
- *SilkWorm 4020 Hardware Reference Manual*
- *SilkWorm 4020 QuickStart Guide*

For practical discussions about SAN design, implementation, and maintenance, you can obtain *Building SANs with Brocade Fabric Switches* through:

> *http://www.amazon.com*

For information about how to use Fabric OS features in a SAN solution, refer to the *Principles of SAN Design* (ISBN 0-7414-2824-5), available from the SAN Administrator's Bookshelf. You can order the book and view a sneak preview at:

> *http://www.brocade.com/products/sanadmin_bookshelf/index.jsp*

For additional Brocade documentation, visit the Brocade SAN Info Center and CLIck the Resource Library location:

> *http://www.brocade.com*

Release Notes are available on the Brocade Connect Web site and are also bundled with the Fabric OS firmware.

Other industry resources

For additional resource information, visit the Technical Committee T11 Web site. This Web site provides interface standards for high-performance and mass storage applications for Fibre Channel, storage management, as well as other applications:

> *http://www.t11.org*

For information about the Fibre Channel industry, visit the Fibre Channel Industry Association Web site:

> *http://www.fibrechannel.org*

For information about the iSCSI (internet small computer systems interface) standards, visit the following Web site:

> *http://www.ietf.org/rfc/rfc3720.txt*

Optional Brocade features

For a list of optional Brocade features and descriptions, see the *Fabric OS Administrator's Guide*.

Getting technical help

Contact your switch support supplier for hardware, firmware, and software support, including product repairs and part ordering. To expedite your call, have the following information available:

1. **General Information**

   - Technical Support contract number, if applicable
   - Switch model
   - Switch operating system version
   - Error numbers and messages received
   - **supportSave** command output
   - Detailed description of the problem and specific questions
   - Description of any troubleshooting steps already performed and results
   - Serial console and telnet session logs
   - syslog message logs

2. **Switch Serial Number**

   The switch serial number and corresponding bar code are provided on the serial number label, as illustrated below.

   FT00X0054E9

   The serial number label is located as follows:

   - *SilkWorm 3014*—On the top of the chassis, under the insertion arm
   - *SilkWorm 3016 and 4012*—On the bottom of the switch module
   - *SilkWorm 4018*—On the top of the blade
   - *SilkWorm 200E, 3200, 3250 and 3850*—On the bottom of the chassis
   - *SilkWorm 3800 and 3900*—Nonport side of the chassis
   - *Brocade 5000, SilkWorm 4100, 4900, and 7500*—On the switch ID pull-out tab located inside the chassis on the port side on the left
   - *SilkWorm 4016*—Top of the switch module
   - *SilkWorm 4024*—Bottom of the switch module
   - *SilkWorm 12000, 24000, and 48000*—Inside the chassis next to the power supply bays
   - *SilkWorm Multiprotocol Router Model AP7420*—On the bottom of the chassis and on the back of the chassis.

3. **World Wide Name (WWN)**

- *Brocade 5000, SilkWorm 200E, 3014, 3016, 3250, 3800, 3850, 3900, 4012, 4018, 4020, 4024, 4100, 4900, and 7500 switches and SilkWorm 24000, and 48000 directors:* Provide the license ID. Use the **licenseIdShow** command to display the license ID.

- *SilkWorm Multiprotocol Router Model AP7420:* Provide the switch WWN. Use the **switchShow** command to display the switch WWN.

- *All other SilkWorm switches:* Provide the switch WWN. Use the **wwn** command to display the switch WWN.

Document feedback

Because quality is our first concern at Brocade, we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you. Forward your feedback to:

documentation@brocade.com

Provide the title and version number and as much detail as possible about your issue, including the topic heading and page number and your suggestions for improvement.

Introduction to the Brocade Access Gateway

This chapter describes the functions of Brocade Access Gateway. The SilkWorm 4012, 4016, 4020, and 4024 embedded switches running Fabric OS v5.2.1 or higher support Access Gateway (AG).

The chapter covers the following topics:

Overview of Brocade Access Gateway

Brocade Access Gateway allows multiple hosts (or HBAs) to access the fabric using fewer physical ports. Access Gateway mode transforms an embedded switch into a device management tool that is compatible with different types of fabrics, including Brocade-, Cisco-, and McDATA-based fabrics (see the matrix in Appendix B, "Compatibility" for more details).

When a switch is in Access Gateway mode, it is logically transparent to the host and the fabric. Brocade Access Gateway modes allows hosts to access the fabric without increasing the number of switches and simplifies configuration and management in a large fabric by reducing the number of domain IDs and ports.

Brocade Access Gateway is a device management tool and provides only a subset of Fabric OS commands. It does not consume critical fabric elements that could inhibit scalability. For example, a fabric that uses Access Gateways to connect hosts requires fewer domain IDs.

The following figure compares a configuration that connects eight hosts to the fabric using Brocade Access Gateway to the same configuration with standard fabric switches.
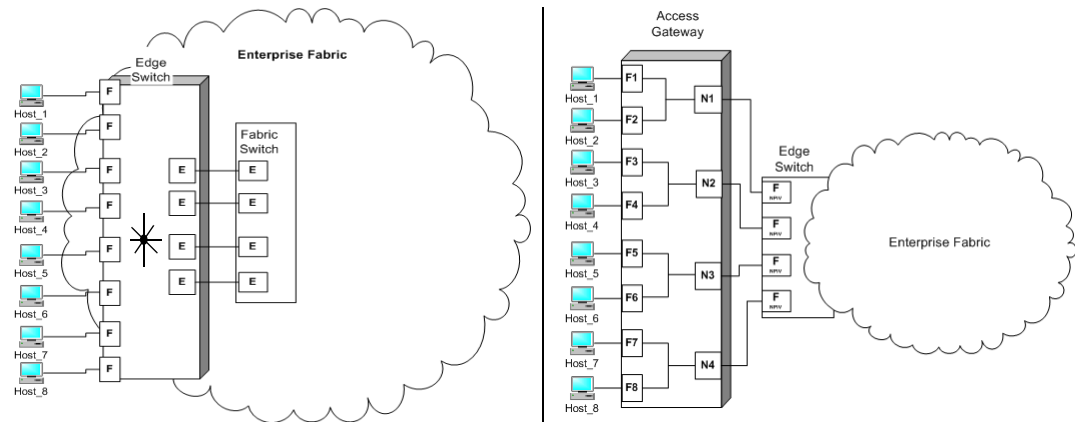
Figure 1-1 Access Gateway and fabric switch comparison

The difference between the fabric switch (Fabric OS native mode) and Brocade Access Gateway is as follows:

- The Fabric OS switch is a part of the fabric; it requires two through four times as many physical ports, consumes fabric resources, and can connect to a Brocade-based fabric only.

- Brocade Access Gateway is outside the fabric; it reduces the number of switches on the fabric and the number of required physical ports. You can connect Brocade Access Gateway to either a Brocade-, Cisco-, or McDATA-based fabric.

> **Note**
>
> When using a Brocade blade server embedded switch in Access Gateway mode, most switch features are no longer applicable. These features include Admin Domains, Advanced Performance Monitoring, direct connection to SAN target devices, Fibre Channel Arbitrated Loop support, Fabric Manager, FICON, IP over FC, ISL Trunking, Extended Fabrics, Management Services, Name Services (SNS), port mirroring, Secure Fabric OS, SMI-S, and Zoning. These switch features are available in the default switch mode of operation.

Access Gateway port types

Brocade Access Gateway differs from a typical fabric switch because it connects to the fabric using node ports (N_Ports). Typically fabric switches connect to the enterprise fabric using ISL (InterSwitch Link) ports, such as an E_Port.

The following defines the Fibre Channel (FC) port terms used in this manual:

- **F_Port,** fabric port. A switch port that connects a host, HBA, or storage device to the SAN.

- **N_Port**, node port. A host, HBA, or storage device port that connects to the F_Port of the fabric switch.

Comparing FC port configurations

Brocade Access Gateway multiplexes host connections to the fabric. It presents an F_Port to the host and an N_Port to an edge fabric switch. Using N_Port ID virtualization (NPIV), Brocade Access Gateway allows multiple FC initiators to access the SAN on the same physical port. This reduces the hardware requirements and management overhead of hosts to the SAN connections.

A fabric switch presents F_Ports (or FL_Ports) to the host and storage devices and presents E_Ports, TE_Ports, or EX_Ports to other switches in the fabric. A fabric switch consumes SAN resources, such as domain IDs, and participates in fabric management and zoning distribution. A fabric switch requires more physical ports than Brocade Access Gateway to connect the same number of hosts.

Figure 1-2 compares the types of ports used by the Access Gateway to those used by a typical fabric switch.
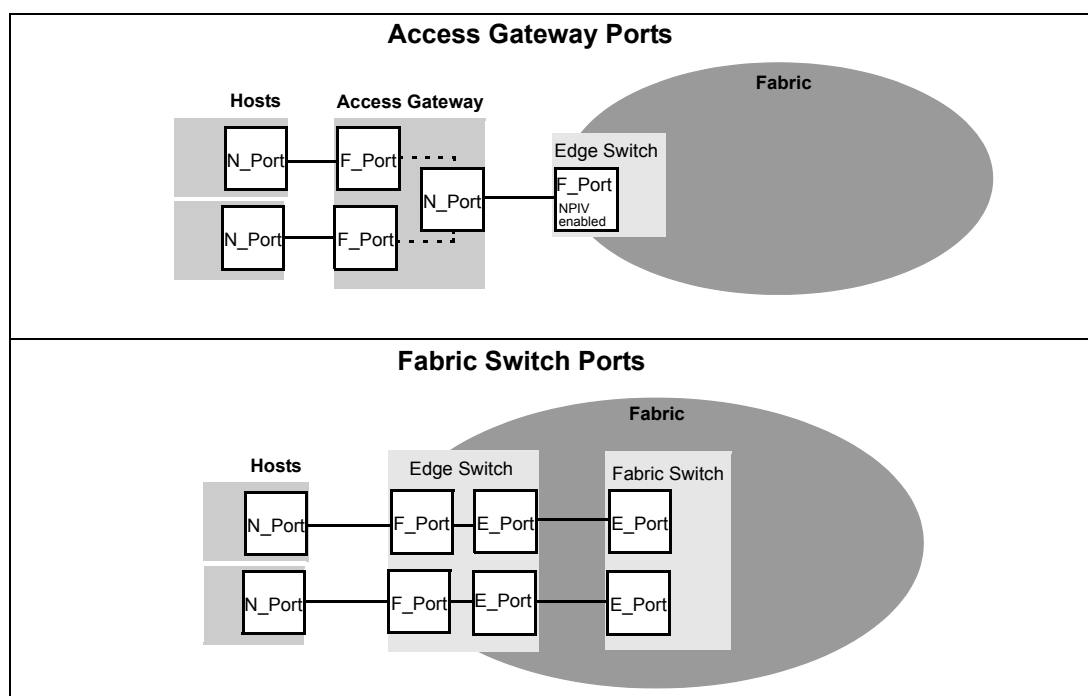
Figure 1-2   Port usage comparison

Table 1-1 Compares port configuration between Access Gateway with a typical fabric switch.

Table 1-1   Port Configurations

Port Type	Access Gateway		Fabric switch	
F_Port	Yes	Connects hosts to Brocade Access Gateway.	Yes	Connects devices, such as hosts, HBAs, and storage to the fabric.
N_Port	Yes	Connects Access Gateway to a fabric switch.	NA	N_Ports are not supported.
E_Port	NA	ISL is not supported.[1]	Yes	Connects the switch to other switches to form a fabric.

1.   The switch is logically transparent to the fabric, therefore it does not participate in the SAN as a fabric switch.

Port mapping

Brocade Access Gateway uses mapping—that is, pre-provisioned routes—to direct traffic from the hosts to the fabric. When you first enable Access Gateway mode, the F_Ports are mapped to a set of predefined N_Ports, see Appendix A, "Default Port Mapping". After the initial setup, you can manually change the mapping if required.

Figure 1-3 shows a mapping with eight F_Ports evenly mapped to four N_Ports on Brocade Access Gateway. The N_Ports connect to the same fabric via different edge switches. This example is also used to explain mapping, failover, and failback polices.
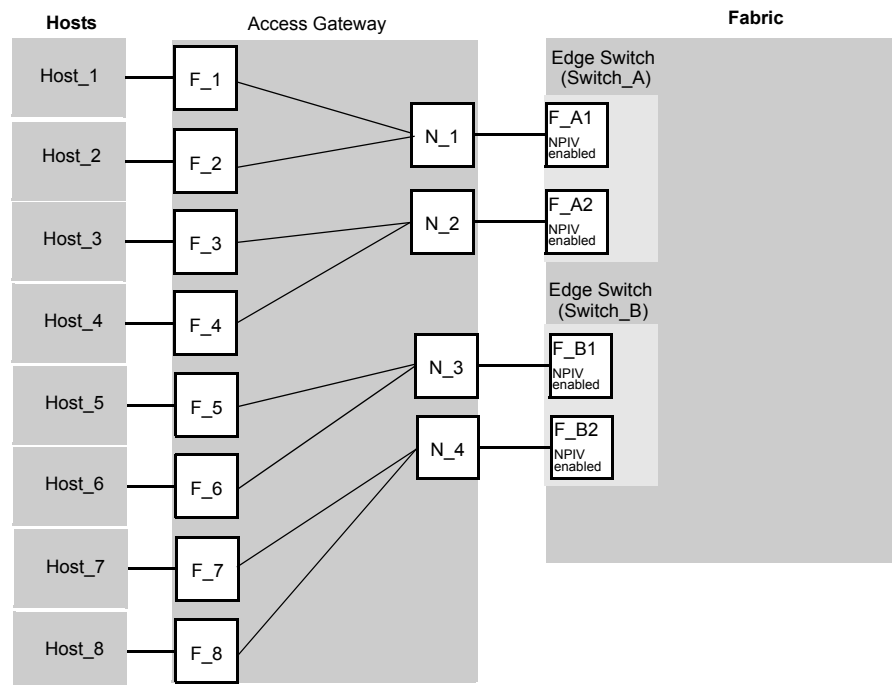
Figure 1-3   Example F_Port to N_Port mapping

The following table describes the mapping and fabric connection shown in Figure 1-3:

Table 1-2   Example port mapping

Access Gateway		Fabric	
N_Port	**F_Port**	**Edge switch**	**F_Port**
N_1	F_1, F_2	Switch_A	F_A1
N_2	F_3, F_4	Switch_A	F_A2
N_3	F_5, F_6	Switch_B	F_B1
N_4	F_7, F_8	Switch_B	F_B2

Port initialization

To ensure that all hosts are brought online when Brocade Access Gateway starts up, the ports are initialized in the following manner:

1. All N_Ports are initialized. During N_Port initialization all the F_Ports are disabled (kept OFFLINE).

    The ports are enabled or disabled as follows:

    *   **Enabled** (online) if the port receives a fabric login event and is connected to an F_Port of an edge switch that supports NPIV (N_Port ID virtualization).

    *   **Disabled** (offline) if the port is not connected to a fabric or is connected to a fabric port that does not support NPIV.

2. All F_Ports mapped to online N_Ports are enabled. F_Ports that are inactive or that have no hosts are disabled.

3. F_Ports mapped to an offline N_Port with the failover policy enabled fail over to an online N_Port.

4. The host logs in to the fabric as follows:

    a. The host sends a FLOGI (fabric login) request.

    b. Access Gateway proxies the request using FDISC primitive to the fabric with the same parameters as the host.

    c. The fabric processes the request and sends an FDISC response.

    d. Access Gateway proxies the response to the host using the same parameters as the fabric.

    e. The host receives the response from the fabric.

    After ports are initialized, Access Gateway becomes logically transparent to the host and the fabric, as shown in Figure 1-4.
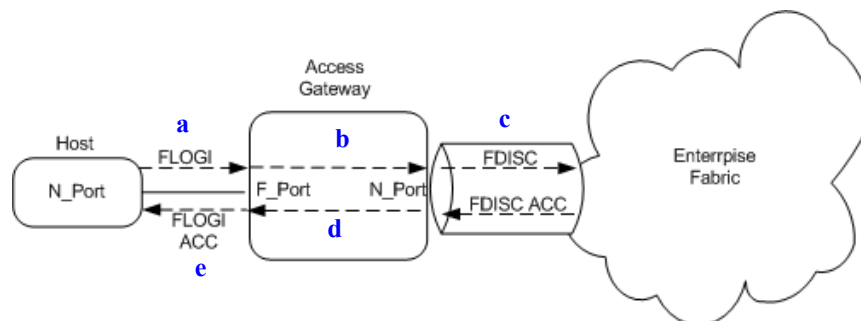
Figure 1-4   Host log in request

Failover policy

The Brocade Access Gateway N_Port failover policy allows hosts to automatically remap to an online N_Port if the N_Port they are connected to goes offline. The failover policy evenly distributes the F_Ports that are mapped to an offline N_Port among all the online N_Ports. The failover policy is a parameter of each N_Port. By default, the failover policy is enabled for all N_Ports.

The following sequence describes how a failover event occurs:

1. An N_Port goes offline.

2. All F_Ports mapped to that N_Port are disabled.

3. If the N_Port failover policy is enabled, the disabled F_Ports are remapped to an online N_Port.

   The F_Ports are evenly distributed among the remaining online N_Ports.

4. The F_Port is re-enabled on the new N_Port.

5. The host establishes a new connection with the fabric.

Example: Failover Policy

This example shows the failover behavior in a scenario where two fabric ports go offline, one after the other.

- First the edge switch F_A1 port goes offline, as shown in Figure 1-5 example 1 (left), causing the corresponding Access Gateway N_1 port to be disabled.

  The ports mapped to N_1 fail over; F_1 fails over to N_2 and F_2 fails over to N_3.

- Next the F_A2 port goes offline, as shown in Figure 1-5 example 2 (right), causing the corresponding Access Gateway N_2 port to be disabled.

The ports mapped to N_2 (F_1, F_3, and F_4) failover to N_3 and N_4. Note that the F_Ports are evenly distributed to the remaining online N_Ports and that the F_2 did not participate in the failover event.
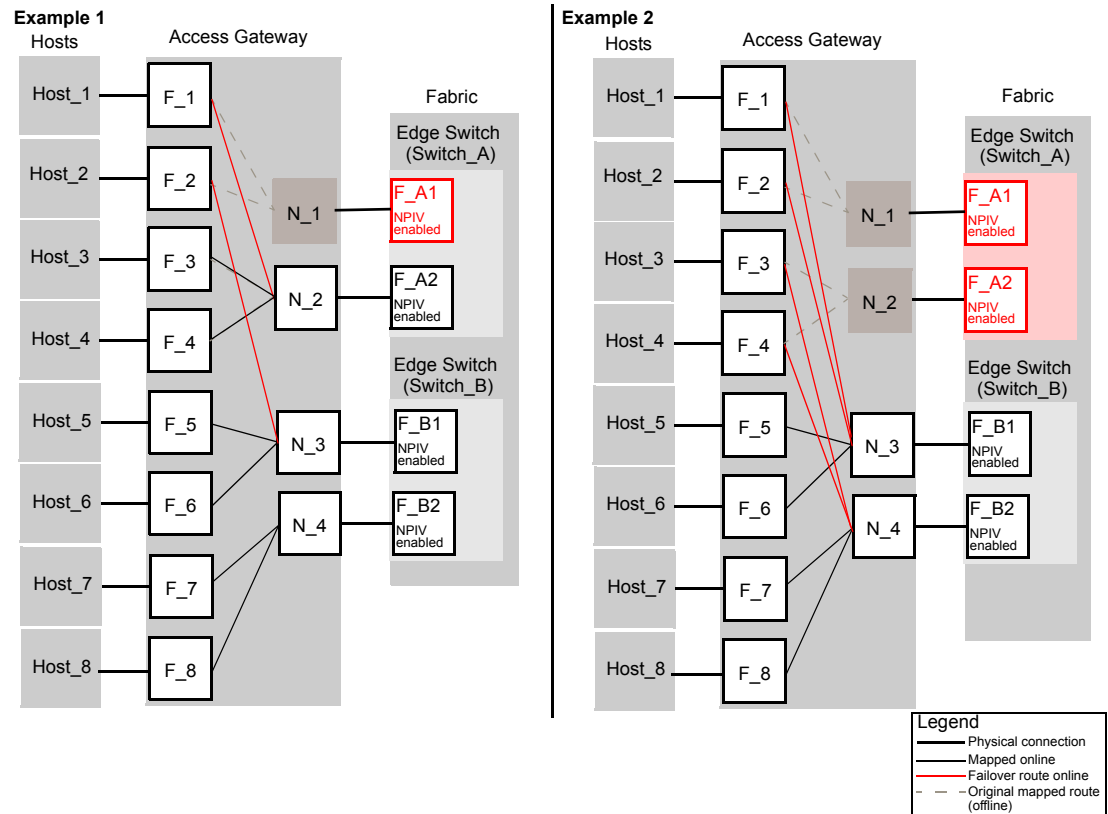
Figure 1-5   Example 1 and 2 failover policy behavior

Failback policy

The Brocade Access Gateway failback policy automatically reroutes the F_Ports back to the originally mapped N_Ports as those N_Ports come back online.

Only the originally mapped F_Ports fail back. In the case of multiple N_Port failures, only F_Ports that were mapped to the recovered N_Port experience failback. The remaining F_Ports are not redistributed among the online N_Ports during the failback.

> **Note**
> The failback policy is an N_Port parameter. The failback policy is enabled by default.

The following sequence describes how a failback event occurs:

1. When an N_Port comes back online, the F_Ports that were originally mapped to it are disabled.

2. The F_Port is reenabled on the original N_Port.

3. The host establishes a new connection with the fabric.

Example: Failback Policy

In Example 3, the Brocade Access Gateway N_1 remains disabled because the corresponding F_A1 port is offline. However N_2 comes back online. (See Figure 1-5 for the original failover scenario.)

The ports mapped to N_1 (F_1 and F_2) continue to be routed to N_3; the ports originally mapped to N_2 (F_3 and F_4) are disabled, rerouted to N_2, and then enabled.

Example 3
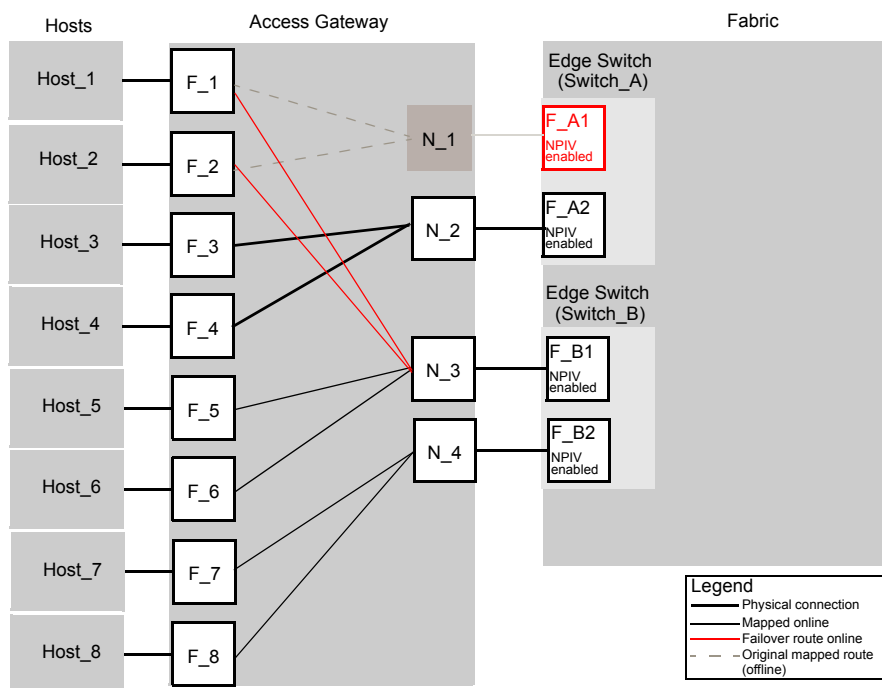
Figure 1-6 Failback policy behavior

Chapter

Configuring Access Gateway

2

This chapter describes the initial set up required to deploy Brocade Access Gateway.

> **Note**
> Install and configure the switch as described in the switch's *Hardware Reference Manual* before performing these procedures.

This chapter covers the following topics:

- *"Verifying the fabric and edge switch settings"* on page 2-1
- *"Enabling Access Gateway mode"* on page 2-2

Verifying the fabric and edge switch settings

In order to connect hosts to the fabric using Access Gateway, configure the fabric using the following parameters. The listed parameters apply to Brocade-, McDATA-, and Cisco-based fabrics:

- Configure the F_Ports on the edge switch to which Access Gateway is connected as follows:
    - Enable NPIV.
    - Disable long distance mode.
    - Allow multiple logins. The recommended fabric login setting is set to the maximum allowed per port and per switch.
- Use only WWN zoning throughout the fabric. Access Gateway does not support domain ID and other types of zoning schemes.
- Include either Access Gateway WWN or the N_Port and F_Port WWNs in ACL policies.
- Allow inband queries for forwarded fabric management requests from the hosts. Add the Access Gateway switch WWN to the access list if inband queries are restricted.

> **Note**
> Before connecting Access Gateway to a Brocade-based fabric, disable Fabric OS Management Server Platform Service. After Access Gateway is connected, you can reenable the service.

Enabling Access Gateway mode

This sections explains how to change the switch mode from Fabric OS native mode to Access Gateway mode. Converting a switch to a Brocade Access Gateway allows you to use the switch as a device management tool that transparently connects hosts to the fabric.

Enable Access Gateway mode using one of the following methods:

Using Web Tools to enable Access Gateway mode

Once you enable Access Gateway mode, only a limited subset of switch menus are available; fabric management menus are grayed out. All fabric-related service requests are forwarded to the fabric switches.

> **Note**
>
> If you are converting an existing switch to a Brocade Access Gateway, save the switch configuration before enabling Access Gateway mode.

To enable Access Gateway mode with Web Tools

1. Select Brocade Access Gateway from the Fabric Tree.

   The selected switch appears in the Switch View.

2. Click the **Admin** button on the Switch View.

The Switch Admin module displays as shown below.

> **Note**
>
> To save the switch configuration, go to the **Configure > Upload/Download** subtab and upload the configuration file before proceeding with the next step.

3. Click the **Disable** radio button in the **Switch Status** section.

4. Click the **Enable** radio button in the **Access Gateway Mode** section.

5. Click **Apply**.

6. Click **Yes** to restart the switch in Access Gateway mode.

Using the CLI to enable Access Gateway mode

Enabling Access Gateway mode is a disruptive process; the switch is disabled and rebooted. Once you enable Access Gateway mode, only a limited subset of Fabric OS commands are available and all fabric-related service requests are forwarded to the fabric switches. See Appendix D, "Access Gateway Commands and Messages".

> **Note**
>
> If you are converting an existing switch to a Brocade Access Gateway, save the switch configuration before enabling Access Gateway mode.

Table 2-1 describes the commands used to enable Access Gateway mode:

Table 2-1 Access Gateway Enable Command list

Step	Command	Description
1.	**switchDisable**	Disable the switch.
2. (Optional)	**configUpload**	Save the switch's current configuration. When you enable Access Gateway mode some fabric information is erased, such as the zone and security databases.
3.	**ag --modeEnable**	Enable Access Gateway mode. The switch will reboot and come back online in Access Gateway mode.
4. (Optional)	**ag --modeShow**	Verify that Access Gateway mode has been enabled.
5. (Optional)	**ag --mapShow**	Display the F_Port to N_Port mapping.
6. (Optional)	**switchShow**	Ensure that all the ports are mapped and online.

To enable Access Gateway mode from the CLI

1. Connect and log in to the switch.

2. Enter the **switchShow** command to display the current switch configuration.

    The example below shows a switch in the Fabric OS Native mode (where switchMode equals Native).

```
switch:admin> switchshow
switchName:     switch
switchType:     43.2
switchState:    Online
switchMode:     Native
switchRole:     Principal
switchDomain:   1
switchId:       fffc01
switchWwn:      10:00:00:05:1e:03:4b:e7
zoning:         OFF
switchBeacon:   OFF

Area Port Media Speed State      Proto
=====================================
  0   0   --    N4   No_Module
  1   1   cu    N4   Online          F-Port  50:06:0b:00:00:3c:b7:32
  2   2   cu    N4   Online          F-Port  10:00:00:00:c9:35:43:f5
  3   3   cu    AN   No_Sync
  4   4   cu    AN   No_Sync         Disabled (Persistent)
  5   5   cu    N4   Online          F-Port  50:06:0b:00:00:3c:b4:3e
  6   6   cu    N4   Online          F-Port  10:00:00:00:c9:35:43:f3
  7   7   cu    AN   No_Sync         Disabled (Persistent)
  8   8   cu    AN   No_Sync
  9   9   cu    AN   No_Sync         Disabled (Persistent)
 10  10   cu    AN   No_Sync         Disabled (Persistent)
 11  11   cu    AN   No_Sync         Disabled (Persistent)
 12  12   cu    AN   No_Sync         Disabled (Persistent)
 13  13   cu    AN   No_Sync         Disabled (Persistent)
 14  14   cu    AN   No_Sync         Disabled (Persistent)
 15  15   cu    AN   No_Sync         Disabled (Persistent)
 16  16   cu    AN   No_Sync         Disabled (Persistent)
 17  17   --    N4   No_Module
 18  18   --    N4   No_Module
 19  19   --    N4   No_Module
 20  20   --    N4   No_Module
 21  21   id    N4   Online          E-Port  segmented,(zone conflict)(Trunk master)
 22  22   id    N4   Online          E-Port  (Trunk port, master is Port 21 )
 23  23   id    N4   Online          E-Port  (Trunk port, master is Port 21 )
```

3. Enter the **switchDisable** command to disable the switch.

```
switch:admin> switchdisable
```

> **Note**
> To save the switch configuration, use the **configUpload** command before proceeding
> with the next step.

4. Enter the **ag --modeEnable** command to enable Access Gateway mode.

```
switch:admin> ag --modeenable
```

The switch automatically reboots and comes back online in Access Gateway mode using a factory
default F_Port to N_Port mapping. See Appendix A, "Default Port Mapping".

5. Enter the **ag --modeShow** command to verify that Access Gateway mode has been enabled.

```
switch:admin> ag --modeshow
Access Gateway mode is enabled.
```

6. Enter the **ag --mapShow** command without any options to display all the mapped ports.

The following example shows a mapping that has been reconfigured, three N_Ports 17, 19 and 20 have no mappings and are not connected to the fabric.

```
switch:admin> ag --mapshow
N_Port  Configured_F_Ports        Current_F_Ports         Failover Failback
--------------------------------------------------------------------------
   0    9;10;                     None                        1         1
  17    None                      None                        1         1
  18    3;4;                      None                        1         1
  19    None                      None                        1         1
  20    None                      None                        1         1
  21    1;2;11;12;                1;2;                        1         1
  22    5;13;14;                  5;                          1         1
  23    6;15;16;                  6;                          1         1
--------------------------------------------------------------------------
```

7. Enter the **switchShow** command without any options to display the status of all ports.

```
switch:admin> switchshow
switchName:     switch
switchType:     43.2
switchState:    Online
switchMode:     Access Gateway Mode
switchWwn:      10:00:00:05:1e:03:4b:e7
switchBeacon:   OFF

Area Port Media Speed State      Proto
=====================================
  0   0    --   N4   No_Module
  1   1    cu   N4   Online       F-Port  50:06:0b:00:00:3c:b7:32 0x5a0101
  2   2    cu   N4   Online       F-Port  10:00:00:00:c9:35:43:f5 0x5a0003
  3   3    cu   N4   Online       F-Port  50:06:0b:00:00:3c:b6:1e 0x5a0102
  4   4    cu   N4   Online       F-Port  10:00:00:00:c9:35:43:9b 0x5a0002
  5   5    cu   N4   Online       F-Port  50:06:0b:00:00:3c:b4:3e 0x5a0201
  6   6    cu   N4   Online       F-Port  10:00:00:00:c9:35:43:f3 0x5a0202
  7   7    cu   AN   No_Sync      Disabled (Persistent)
  8   8    cu   N4   Online       F-Port  10:00:00:00:c9:35:43:a1 0x5a0001
  9   9    cu   AN   No_Sync      Disabled (Persistent)
 10  10    cu   AN   No_Sync      Disabled (Persistent)
 11  11    cu   AN   No_Sync      Disabled (Persistent)
 12  12    cu   AN   No_Sync      Disabled (Persistent)
 13  13    cu   AN   No_Sync      Disabled (Persistent)
 14  14    cu   AN   No_Sync      Disabled (Persistent)
 15  15    cu   AN   No_Sync      Disabled (Persistent)
 16  16    cu   AN   No_Sync      Disabled (Persistent)
 17  17    --   N4   No_Module
 18  18    --   N4   No_Module
 19  19    id   N4   No_Light
 20  20    --   N4   No_Module
 21  21    id   N4   Online       N-Port  10:00:00:05:1e:35:10:1e 0x5a0200
 22  22    id   N4   Online       N-Port  10:00:00:05:1e:35:10:1e 0x5a0100
 23  23    id   N4   Online       N-Port  10:00:00:05:1e:35:10:1e 0x5a0000
```

Disabling Access Gateway Mode

This chapter describes how to disable Access Gateway mode. Disabling Access Gateway mode is disruptive; the switch is disabled and rebooted.

This chapter covers the following topics:

- *"Before you begin"* on page 3-2
- *"Disabling Access Gateway mode"* on page 3-3

Before you begin

Always back up the current configuration before enabling or disabling Access Gateway mode. Enabling Access Gateway mode clears the security and zone databases. Disabling Access Gateway mode clears the F_Port to N_Port mapping.

Backing up the switch configuration

If the switch was configured as a fabric switch, save the configuration before setting up the switch in Access Gateway mode.

To back up a configuration file using Web Tools

1. Launch the Switch Admin module.

2. Click the **Configure** tab.

3. Click the **Upload/Download** subtab.

4. Click the **Config Upload to Host** radio button.

5. Type the host IP, user name, file name, and password.

6. Type the configuration file with a fully qualified path.

7. Select a protocol to use to transfer the file.

8. Click **Apply**.

    You can monitor the progress by looking at the Upload/Download progress bar on the **Configure** tab.

To upload a configuration file using the CLI

1. Verify that the FTP service is running on the host computer.

2. Connect to the switch and log in.

3. Enter the **configUpload** command. The command becomes interactive and you are prompted for the required information.

Disabling Access Gateway mode

Access Gateway mode transforms the switch into a device management tool. After Access Gateway mode is disabled, the switch starts in Fabric OS Native mode, and the standard set of Fabric OS commands are available. Disable Access Gateway mode using one of the following methods:

- "Using Web Tools to Disable Access Gateway mode" on page 3-3
- "Using the CLI to disable Access Gateway mode" on page 3-4

Using Web Tools to Disable Access Gateway mode

After you disable Access Gateway mode, use the instructions in the *Web Tools Administrator's Guide* to reconfigure the switch and join it to the fabric.

To disable Access Gateway mode

1. Open a Web Tools session directly on the Brocade Access Gateway.

   The switch appears in the Switch View.

2. Click the **Admin** button on the Switch View.

   The Switch Admin module displays.

   > **Note**
   > To save the switch configuration, go to the **Configure > Upload/Download** subtab and upload the configuration file before proceeding with the next step.

3. Click the **Disable** radio button in the **Switch Status** section.

4. Click the **Disable** radio button in the **Access Gateway Mode** section.

5. Click **Apply**.

6. Click **Yes** to restart the switch in Fabric OS Native mode.

Using the CLI to disable Access Gateway mode

After you disable Access Gateway mode, use the instructions in the *Fabric OS Administrator's Guide* to reconfigure the switch and join it to the fabric.

> **Note**
> Disabling Access Gateway mode clears the current Access Gateway mode configuration and reboots the switch.

To disable Access Gateway mode

1. Connect and log in to the switch.

2. Enter the **ag --modeshow** command to verify that the switch is in Access Gateway mode.

```
switch:admin> ag --modeshow
Access Gateway mode is enabled
```

3. Enter the **switchDisable** command to disable the switch.

```
switch:admin> switchdisable
```

> **Note**
> To save the Access Gateway configuration, use the **configUpload** command before proceeding with the next step.

4. Enter the **ag** command with the **--modedisable** operand to disable Access Gateway mode.

```
switch:admin> ag --modedisable
```

The switch automatically reboots and comes back online using the fabric switch configuration; the Access Gateway parameters, such as F_Port to N_Port mapping, failover, and failback policies are automatically removed.

5. Enter the ag --modeshow command to verify that Access Gateway mode has been disabled.

```
switch:admin> ag --modeshow
Access Gateway mode is NOT enabled
```

> **Note**
> Use the **configDownload** command to restore a previous fabric configuration.

Notes on joining the switch to a fabric

After the switch reboots when Access Gateway mode is disabled, the default zone is set to no access. Therefore the switch does not imediately join the fabric to which it is connected. Use one of the following methods to join the switch to the fabric:

- If you saved a Fabric OS configuration before enbling AG mode, download the configuration using the **configDownload** command. See

- If you want to join the switch to the fabric using the fabric configuration, follow the steps in

To use a previous configuration

1. Enter the **switchDisable** command to disable the switch.

2. Enter the **configDownload** command to revert to the previous configuration.

3. Enter the **switchEnable** command to bring the switch back online.

   The switch automatically joins the fabric.

To allow the switch to merge with the fabric

> **Note**
> Only connect the switch to the fabrics which you want it to join.

1. Enter the **switchDisable** command to disable the switch.

2. Enter the **defZone –allAccess** command to allow the switch to merge with the fabric.

3. Enter the **cfgSave** command to commit the defzone changes.

4. Enter the **switchEnable** command to enable the switch and allow it to merge with the fabric.

   The switch automatically joins the fabric.

Managing Ports in Access Gateway mode

This chapter explains how to use the CLI to manage the ports on Brocade Access Gateway.

> **Note**
> The Access Gateway port management functions are not available from Web Tools.

It covers the following topics:

- *"Determining the mapping and port status"* on page 4-2
- *"Configuring port maps"* on page 4-4
- *"Managing the failover and failback policies"* on page 4-7
- *"Configuring additional F_Ports"* on page 4-9

Determining the mapping and port status

This section explains how to display the current mapping and port status.

Displaying the port mapping

This section explains how to display the mapped routes of the host connections to the fabric on Brocade Access Gateway. F_Ports are mapped to N_Ports.

See the Fabric OS Command Reference for more details on using the **ag** command with the **--mapshow** operand.

To display all mappings

1. Connect and log in to the switch.

2. Enter the **ag --mapshow** command without any options to display all the mapped ports.

N_Port	Port numbers of ports locked in N_Port mode.
Configured F_Ports	List of F_Ports that are mapped to the corresponding N_Port; for example: F_Ports 9 and 10 are mapped to N_Port 0.
Current F_Ports	Shows the F_Ports that are currently connected to the fabric on the corresponding N_Port.
	In the case of failover, the Current F_Port and Configured F_Ports differ. For example, ports 9 and 10 are mapped to 0, however 0 is offline, therefore 9 and 10 failed over to 22 and 23.
Failover and Failback	Indicates whether or not N_Port policy is enabled (1) or disabled (0).

```
switch:admin> ag --mapshow
N_Port  Configured_F_Ports       Current_F_Ports         Failover Failback
---------------------------------------------------------------------------
    0    9;10;                    None                    1         1
   17    None                     None                    1         1
   18    3;4;                     None                    1         1
   19    None                     None                    1         1
   20    None                     None                    1         1
   21    1;2;11;12;               1;2;                    1         1
   22    5;13;14;                 5;9;                     1          1
   23    6;15;16;                 6;10;                    1         1
---------------------------------------------------------------------------
```

To display an N_Port map

1. Connect and log in to the switch.

2. Enter the **ag --mapshow** command and specify the port number to display the N_Port failover and failback policies and the mapped F_Ports.

N_Port	Number of the port.
Failover	Indicates whether or not the failover policy is enabled (1) or disabled (0) on the N_Port.
Failback	Indicates whether or not the failback policy is enabled (1) or disabled (0) on the N_Port.
Current F_Ports	Shows the F_Ports that are currently connected to the fabric on this N_Port. In the case of failover, the Current F_Port and Configured F_Ports differ. For example (shown below), 8 failed over to this port from another port.
Configured F_Ports	Indicates the ports which are mapped to this N_Port.

```
switch:admin> ag --mapshow 0

        N_Port                      : 0
        Failover(1=enabled/0=disabled) : 1
        Failback(1=enabled/0=disabled) : 1
        Current F_Ports             : 2;8;
        Configured F_Ports          : 2;
```

Displaying the port status

This section explains how to determine the ports status.

To display the port status

1.   Connect and log in to the switch.

2.   Enter the **switchShow** command without any options to display the status of all ports.

```
switch:admin> switchshow
switchName:    switch
switchType:    43.2
switchState:   Online
switchMode:    Access Gateway Mode
switchWwn:     10:00:00:05:1e:03:4b:e7
switchBeacon:  OFF

Area Port Media Speed State     Proto
=====================================
  0   0   --    N4   No_Module
  1   1   cu    N4   Online          F-Port  50:06:0b:00:00:3c:b7:32 0x5a0101
  2   2   cu    N4   Online          F-Port  10:00:00:00:c9:35:43:f5 0x5a0003
  3   3   cu    N4   Online          F-Port  50:06:0b:00:00:3c:b6:1e 0x5a0102
  4   4   cu    N4   Online          F-Port  10:00:00:00:c9:35:43:9b 0x5a0002
  5   5   cu    N4   Online          F-Port  50:06:0b:00:00:3c:b4:3e 0x5a0201
  6   6   cu    N4   Online          F-Port  10:00:00:00:c9:35:43:f3 0x5a0202
  7   7   cu    AN   No_Sync         Disabled (Persistent)
  8   8   cu    N4   Online          F-Port  10:00:00:00:c9:35:43:a1 0x5a0001
  9   9   cu    AN   No_Sync         Disabled (Persistent)
 10  10   cu    AN   No_Sync         Disabled (Persistent)
 11  11   cu    AN   No_Sync         Disabled (Persistent)
 12  12   cu    AN   No_Sync         Disabled (Persistent)
 13  13   cu    AN   No_Sync         Disabled (Persistent)
 14  14   cu    AN   No_Sync         Disabled (Persistent)
 15  15   cu    AN   No_Sync         Disabled (Persistent)
 16  16   cu    AN   No_Sync         Disabled (Persistent)
 17  17   --    N4   No_Module
 18  18   --    N4   No_Module
 19  19   id    N4   No_Light
 20  20   --    N4   No_Module
 21  21   id    N4   Online          N-Port  10:00:00:05:1e:35:10:1e 0x5a0200
 22  22   id    N4   Online          N-Port  10:00:00:05:1e:35:10:1e 0x5a0100
 23  23   id    N4   Online          N-Port  10:00:00:05:1e:35:10:1e 0x5a0000
```

Configuring port maps

In Access Gateway mode, the F_Ports are mapped to N_Ports. The first time Access Gateway mode is enabled, the default F_Port to N_Port mapping is used. See Appendix A, "Default Port Mapping".

This section explains how to change the mapping. When you update the mapping only the F_Ports that are added or removed are affected.

Note

For bladed servers, the HBA connect to the internal ports. Therefore, the internal ports are F_Ports and by default only the external ports are configured as N_Ports.

Adding F_Ports

Adding an F_Port to an N_Ports routes that traffic to and from the fabric through the specified N_Port. When failover is enabled and the N_Port goes offline or otherwise fails, the F_Port is automatically routed to another N_Port that is connected to the same fabric.

An F_Port can be assigned to only one N_Port at a time. If the F_Port has been assigned to an another N_Port, you must remove it from the N_Port before you can add it in this procedure.

To add F_Ports to an N_Port

1. Connect and log in to the switch.

   Enter the **ag** command with the **--mapdel <n_portnumber**> <**f_portlist**> operand to remove the F_Port from the N_Port. Where the *f_portlist* can contain multiple F_Port numbers separated by semicolons, for example "17;18".

   ```
   switch:admin> ag --mapdel 10 6
   F-Port to N-Port mapping has been updated successfully
   ```

2. Enter the **switchshow** command to verify that the F_Port is free (unassigned).

   Unassigned F_Port status is **Disabled (No mapping for F-Port)**. See port 6 in the example below.

   ```
   switch:admin> switchshow
   switchName:    fsw534_4016
   switchType:    45.0
   switchState:   Online
   switchMode:    Access Gateway Mode
   switchWwn:     10:00:00:05:1e:02:1d:b0
   switchBeacon:  OFF

   Area Port Media Speed State      Proto
   ====================================
     0   0   cu    AN   No_Sync
     1   1   cu    AN   No_Sync           Disabled (N-Port Offline for F-Port)
     2   2   cu    AN   No_Sync           Disabled (N-Port Offline for F-Port)
     3   3   cu    AN   No_Sync           Disabled (N-Port Offline for F-Port)
     4   4   cu    AN   No_Sync           Disabled (N-Port Offline for F-Port)
     5   5   cu    AN   No_Sync           Disabled (N-Port Offline for F-Port)
     6   6   cu    AN   No_Sync           Disabled (No mapping for F-Port)
     7   7   cu    AN   No_Sync
     8   8   cu    AN   No_Sync
     9   9   cu    AN   No_Sync
    10  10   --    N4   No_Module
    11  11   --    N4   No_Module
    12  12   --    N4   No_Module
    13  13   id    N4   Online            N-Port  10:00:00:05:1e:35:10:1e 0x5a0a00
    14  14   id    N4   Online            N-Port  10:00:00:05:1e:35:10:1e 0x5a0900
    15  15   id    N4   Online            N-Port  10:00:00:05:1e:35:10:1e 0x5a0800
   ```

3. Enter the **ag** command with the **--mapadd <n_portnumber**> <**f_portlist**> operand to add the list of F_Ports to the N_Port.

Where the *f_portlist* can contain multiple F_Port numbers separated by semicolons, for example "17;18".

```
switch:admin> ag --mapadd 13 6
F-Port to N-Port mapping has been updated successfully
```

4. Enter the **ag --mapshow** command with the *n_portnumber* operand to display a list of mapped F_Ports. Verify that the F_Ports you added appear in the list.

```
switch:admin> ag --mapshow 13

        N_Port                     : 13
        Failover(1=enabled/0=disabled) : 1
        Failback(1=enabled/0=disabled) : 1
        Current F_Ports            : None
        Configured F_Ports         : 6;7;
```

Removing F_Ports

Removing an F_Port from an N_Port unassigns the F_Port. The F_Port status changes to **Disabled (No mapping for F-Port)**.

To remove an F_Port from an N_Port

1. Connect and log in to the switch.

2. Enter the **ag --mapdel** command with the *n_portnumber "f_portlist"* operands to remove the list of F_Ports from the N_Port.

```
switch:admin> ag --mapdel 13 6
F-Port to N-Port mapping has been updated successfully
```

3. Enter the **ag --mapshow** command with the *n_portnumber* operand to display a list of mapped F_Ports. Verify that the F_Ports you removed are not in the list.

```
switch:admin> ag --mapshow 13

        N_Port                     : 13
        Failover(1=enabled/0=disabled) : 1
        Failback(1=enabled/0=disabled) : 1
        Current F_Ports            : None
        Configured F_Ports         : 7;
```

Managing the failover and failback policies

The failover and failback policies determine the behavior of the F_Port if the N_Port they are mapped to goes OFFLINE or is disabled. By default, the failover policy is enabled and the failback policy is enabled. This section explains how to change the policy settings.

Both the failover and failback processes are disruptive. When a host connection fails over and fails back to another online N_Port, the F_Port connection is disabled and then re-enabled on the new N_Port. Each time the host changes N_Ports, it receives a new PID. The host must establish a new session to the fabric.

Enabling the failover policy

A switch in Access Gateway mode supports automatic N_Port failover to other N_Ports connected to the same fabric. When a port is first configured as an N_Port, the failover policy is enabled by default.

If the N_Port goes offline, the F_Ports mapped to that N_Port are automatically failed over to other online N_Ports connected to the same fabric. If there are multiple online N_Ports connected to the same fabric, the mapped F_Ports are distributed evenly between the N_Ports.

Failover generates an error message.

To enable failover

1. Connect and log in to the switch.

2. Enter the **ag** command with the **--failovershow** <**n_portnumber**> operand to display the failover setting.

```
switch:admin> ag --failovershow 13
Failover on N_Port 13 is not supported
```

3. Enter the **ag** command with the **--failoverenable** <**n_portnumber**> operand to enable failover.

```
switch:admin> ag --failoverenable 13
Failover policy is enabled for port 13
```

To disable failover

1. Connect and log in to the switch.

2. Enter the **ag** command with the **--failovershow** <**n_portnumber**> operand to display the failover setting.

```
switch:admin> ag --failovershow 13
Failover on N_Port 13 is supported
```

3. Enter the **ag --failoverdisable** command with the **--failoverdisable** <**n_portnumber**> operand to disable failover.

```
switch:admin> ag --failoverdisable 13
Failover policy is disabled for port 13
```

Enabling the failback policy

A switch in Access Gateway mode supports automatic F_Port failback to N_Ports when that port comes back online. By default the failback policy is enabled.

When an N_Port with an enabled failback policy comes back online, the F_Ports that were originally mapped to it are automatically rerouted back to the N_Port.

To enable failback

1. Connect and log in to the switch.

2. Enter the **ag --failbackshow** command with the *n_portnumber* operand to display the failover setting.

    ```
    switch:admin> ag --failbackshow 13
    Failback on N_Port 13 is not supported
    ```

3. Enter the **ag --failbackenable** command with the *n_portnumber* operand to enable failover.

    ```
    switch:admin> ag --failbackenable 13
    Failback policy is enabled for port 133
    ```

To disable failback

1. Connect and log in to the switch.

2. Enter the **ag --failbackshow** command with the *n_portnumber* operand to display the failover setting.

    ```
    switch:admin> ag --failbackshow 13
    Failback on N_Port 13 is supported
    ```

3. Enter the **ag --failbackdisable** command with the *n_portnumber* operand to disable failover.

    ```
    switch:admin> ag --failbackdisable 13
    Failback policy is disabled for port 13
    ```

Configuring additional F_Ports

By default, only the internal ports of Brocade Access Gateway are configured as F_Ports. All external ports are configured (locked) as N_Ports. The internal ports connect hosts in the bladed server and external ports connect to the fabric. To connect an additional FCP initiator to an external port, reconfigure an N_Port as an F_Port as follows:

1. Remap any F_Ports on the N_Port that is being converted. See "Adding F_Ports" on page 4-5.

2. Unlock N_Port mode to change the port type to an F_Port. See "Unlocking N_Port mode" on page 4-10.

3. Map the newly configured F_Port to an N_Port. See "Adding F_Ports" on page 4-5.

4. Connect the HBA, host, or other FCP initiator to the F_Port.

> **Note**
>
> A switch in Access Gateway mode must have at least one port configured as an N_Port. Therefore the maximum number of F_Ports that could be mapped to an N_Port is the number of ports on the switch minus 1.

Figure 4-1 shows a diagram of a host connected to an external F_Port of Brocade Access Gateway. Note that the newly configured F_Port was mapped to an N_Port.
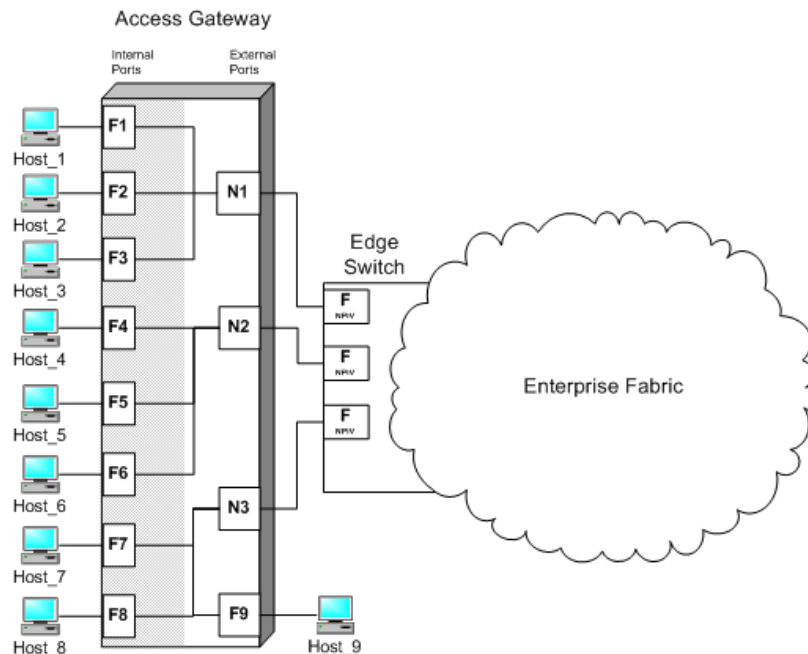

Figure 4-1   Example of adding an external F_Port (F9)

Unlocking N_Port mode

By default, all external ports on Brocade Access Gateway are locked in N_Port mode. Access Gateway supports only two types of ports, N_Ports and F_Ports, because it connects only FCP initiators to the fabric. It does not support other types of ports, such as ISL (InterSwitch Link) ports.

The port types on a fabric switch are not locked. Fabric OS native mode switch dynamically assigns the port type based on the connected device, F_Ports and FL_Ports for hosts, HBAs, and storage devices; and E_Ports, EX_Ports, TE_Ports, etc. for connections to other switches.

Unlocking the N_Port configuration automatically changes the port to an F_Port. When you unlock an N_Port, the F_Ports are automatically unmapped.

To disable N_Port mode

1. Connect and log in to the switch.

2. Enter the **portCfgNport** command to display the N_Port lock settings.

    ```
    switch:admin> portcfgnport

    Ports                0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
    -------------------+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--
    Locked N_Port       .. .. .. .. .. .. .. .. .. .. ON ON ON ON ON ON
    ```

3. Enter the **portCfgNport** command with *slotnumber*/*portnumber* 0 operand to unlock N_Port mode.

    ```
    switch:admin> portcfgnport 10 0
    ```

    > **Note**
    > To lock a port in N_Port mode, enter the **portCfgNport *<slotnumber>*/*<portnumber>* 1** command.

4. Enter the **portCfgNport** command to display the N_Port lock settings and verify that the port is no longer locked in N_Port mode.

    ```
    switch:admin> portcfgnport

    Ports                0  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15
    -------------------+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--+--
    Locked N_Port       .. .. .. .. .. .. .. .. .. .. .. ON ON ON ON ON
    ```

Default Port Mapping

The following table shows the default F_Port to N_Port maps that are automatically configured when Access Gateway mode is enabled. All N_Ports have failover enabled and failback disabled.

Table 0-1   Access Gateway default F_Port to N_Port mapping

SilkWorm Model	Total Ports	N_Ports	F_Ports	Mapping
4012	12	8–11	0–7	0, 1 mapped to 8 2, 3 mapped to 9 4, 5 mapped to 10 6, 7 mapped to 11
4016	16	10–15	0–9	0, 1 mapped to 10 2, 3 mapped to 11 4, 5 mapped to 12 6, 7 mapped to 13 8 mapped to 14 9 mapped to 15
4020	20	0, 15–19	1–14	1, 2 mapped to 0 3, 4 mapped to 15 5, 6, 7 mapped to 16 8, 9 mapped to port 17 10, 11 mapped to 18 12, 13, 14 mapped to 19
4024	24	0, 17–23	1–16	1, 2 mapped to 17 9, 10 mapped to 18 3, 4 mapped to 19 11, 12 mapped to 20 5, 6 mapped to 21 13, 14 mapped to 22 7, 8 mapped to 23 15, 16 mapped to 0

Compatibility

In Access Gateway mode, the switch can connect to a fabric that supports NPIV. An Access Gateway can be connected to more than one fabric. Fabric OS supports NPIV in v5.0.1 and later. This section describes the supported Access Gateway configurations.

Access Gateway Mode Switches

The following switches support Access Gateway mode:

- SilkWorm 4012
- SilkWorm 4016
- SilkWorm 4020
- SilkWorm 4024

Edge Switch Compatibility

Brocade Access Gateway can connect to a Brocade-based fabric on any Brocade-based edge switches running Fabric OS v5.1.0 or later.

Brocade Access Gateway can connect to other types of fabrics on edge switches with the following firmware versions only:

- McDATA firmware v9.0
- Cisco firmware v3.0

Port requirements

Only FCP initiator ports can be connected to Access Gateway as F_Ports. FCP target ports, loop device, and FICON channels/control unit connectivity are not supported.

Troubleshooting

This appendix provides trouble shooting instructions.

Table C-1   Troubleshooting

Problem	Cause	Solution
Switch is not in Access Gateway mode	Switch is in Native switch mode	1. Disable switch using the **switchDisable** command. 2. Enable Access Gateway mode using the **ag --modeenable** command. Answer yes when prompted; the switch reboots. 3. Log in to the switch. 4. Display the switch settings using the **switchShow** command. Verify that the field **switchMode** displays Access Gateway Mode.
NPIV disabled on edge switch ports	Inadvertently turned off	1. On the edge switch, enter the **portCfgShow** command. 2. Verify that NPIV status for the port to which Brocade Access Gateway is connected is ON. 3. If the status displays as "--" NPIV is disabled. Enter the **portCfgNpivPort <port_number>** command with the **1** operand to enabled NPIV. 4. Repeat step 3 for each port as required.
Need to reconfigure N_Port and F_Ports	Default port setting not adequate for customer environment	1. On Brocade Access Gateway, enter the **portCfgShow** command. 2. For each port that is to be activated as N_port, enter the **portCfgNport <port_number>** command with the **1** operand. All other ports remain as F_port. 3. To reset to the port to an F_port, enter the **portCfgNpivPort <port_number>** command with the **0** operand.

Table C-1 Troubleshooting (Continued)

Problem	Cause	Solution
LUNs are not visible	1. Zoning on fabric switch is incorrect. 2. Port mapping on Access Gateway mode switch is incorrect. 3. Cabling not properly connected.	Verify zoning on the edge switch. Verify that F_Ports are mapped to an online N_Port. See "Displaying the port status" on page 4-3. Perform a visual inspection of the cabling, check for issues such as wrong ports, etc.
Failover is not working	Failover disabled on N_Port.	Verify that failover and failback policies are enabled, as follows: • Enter the **ag –failoverShow** command with the **\<port_number\>** operand. • Enter the **ag –failbackShow** command with the **\<port_number\>** operand. Command returns "Failback (or Failover) on N_port \<port_number\> is supported." If it returns, "Failback (or Failover) on N_Port \<port_number\> is not supported." See "Managing the failover and failback policies" on page 4-7.
Access Gateway is mode not wanted	Access Gateway must be disabled.	1. Disable switch using the **switchDisable** command. 2. Enable Access Gateway mode using the **ag --modeDisable** command. Answer yes when prompted; the switch reboots. 3. Log in to the switch. 4. Display the switch settings using the **switchShow** command. Verify that the field **switchMode** displays Fabric OS native mode.

Access Gateway Commands and Messages

This appendix contains the commands and messages that are new for Access Gateway mode in the Fabric OS v5.2.1 release. This appendix uses the same conventions as the Fabric OS Command References.

The appendix covers the following topics:

- *"Access Gateway commands"* on page D-2
- *"Access Gateway system messages"* on page D-5

Access Gateway commands

ag

Enables and manages Access Gateway mode to perform AG specific operations.

Synopsis   **ag --show**

ag --modeshow

ag --modeenable

ag --modedisable

ag --mapshow [N_Port]

ag --mapset *<N_Port> <F_Ports>*

ag --mapadd *<N_Port> <F_Ports>*

ag --mapdel *<N_Port> <F_Ports>*

ag --failovershow [N_Port]

ag --failoverdisable <N_Port>

ag --failoverenable <N_Port>

ag --failbackshow [N_Port]

ag --failbackdisable *<N_Port>*

ag --failbackenable *<N_Port>*

Description   Use this command to enable and disable Access Gateway mode, to display the current configuration and state, to configure and display the F_Port to N_Port mapping, and to configure N_Port failover and failback policies. AG only supports embedded switch platforms that use the Goldneye ASIC.

Operands   This command has the following operands:

--show	Displays the N_Ports and F_Ports that are currently online, whether they have failover enabled, and displays their mapping.
--modeshow	Displays current mode of the switch, either an Access Gateway mode or a native Fibre channel switch (FOS) mode.
--modeenable	Enables Access Gateway mode for a switch.
--modedisable	Disables Access Gateway mode for a switch.
--mapshow [N_Port]	Displays the F_Ports that are mapped to a given N_Port. Current F_Ports are the lists of F_Ports online through the specified N_Port. N_Port is optional and if used, it displays the F_Ports that are mapped to the specified N_Port only.
--mapset *<N_Port F_Ports>*	Maps F_Ports to a specific N_Port to the fabric. Any F_Port can be mapped to only one N_Port. F_Ports are enabled only if the N_Port is online and NPIV is enabled on the fabric port that is connected to Access Gateway.

--mapadd *<N_Port> <F_Ports>*	Adds F_Ports to existing N_Port. The traffic for the configured F_Ports to be routed to the fabric through the specified N_Port when the F_Port comes online. An F_Port can be mapped to only one N_Port. Specify the N_Port number to which the F_Ports are to be mapped. This command overwrites the existing mapping for the N_Port. Specify the list of F_Port numbers to add to the existing specified F_Port to N_Port mapping. The F_Port numbers must be separated my semicolons.
--mapdel *<N_Port> <F_Ports>*	Removes the specified F_Ports from the N_Port mapping. Specify the N_Port number to which the F_Ports are currently mapped. Specify the list of F_Port numbers to remove from the specified F_Ports to N_Port mapping. The F_Port numbers must be separated by semicolons.
--failovershow [N_Port]	Displays the failover policy for the N_Port. Use this command with the N_Port parameter to see if the failover for this N_Port is enabled or not. If an N_Port failure occurs when the failover policy is enabled, all F_Ports mapped to the failed N_Port will failover to another N_Port connected to the same fabric, and then those F_Ports are re-enabled.
--failoverdisable *<N_Port>*	Disables the failover policy for an N_Port.
--failoverenable *<N_Port>*	Enables the failover policy for an N_Port. When the failover policy is enabled for an N_Port and failure occurs on that port, all F_Ports mapped to the failed N_Port will failover to another N_Port connected to the same fabric, and then those F_Ports are re-enabled.
--failbackshow [N_Port]	Displays the failover policy for the N_Port (s).
--failbackdisable *<N_Port>*	Disables the failback policy for an N_Port.
--failbackenable *<N_Port>*	Enables the failback policy for an N_Port.

Examples   To display Access Gateway information:

```
switch:admin> ag --show
    Name             : switch
    NodeName         : 10:00:00:05:1e:35:10:57
    Number of Ports  : 16
    IP Address(es)   : 10.115.74.54
    Firmware Version : v5.2.1.v5.2.x_maint_061106_2
    N_Ports          : 3
    F_Ports          : 8
    Attached N_Port information:
     Port  PortID       PortWWN                FO FB  IP Addr        F_Ports
        ------------------------------------------------------------------
        2   0x020600  20:06:00:05:1e:34:15:c6  1  1   10.115.74.200    0;1;
        3   0x020500  20:05:00:05:1e:34:15:c6  1  1   10.115.74.200    5;6;
        15  0x060700  20:07:00:05:1e:34:15:c6  1  1   10.115.74.59     9;10;11;12;
       ------------------------------------------------------------------
Attached F_Port information:
    Port  PortID    Port WWN               N_Port
    0     0x429c02  10:00:00:00:c9:3f:7d:4a   2
    1     0x429c01  21:00:00:e0:8b:a8:68:58   2
    5     0x429B01  21:00:00:e0:8b:88:92:e8   3
    6     0x429B02  21:00:00:e0:8b:88:68:58   3

--------------------------------------------

Note: ag --show always shows the current online information.
```

To display all the F_Ports that are mapped to a given N_Port:

```
 ST2:admin> ag --mapshow

N_Port  Configured_F_Ports   Current_F_Ports   Failover  Failback
--------------------------------------------------------------------
   2       0;1;                 0;1;                1        1
   3       5;6;                 5;6;                1        1
   15      9;10;11;12;          9;10;11;12;         1        1
--------------------------------------------------------------------


ST2: admin> ag --mapshow 15
--------------------------------------------------------------------
   N_Port2                          : 15
   Failover (1=enabled/0=disabled   : 1
   Failback (1=enabled/0=disabled)  : 1
   Current F_Ports                  : 9;10;11;12;
   Configured F_Ports               : 9;10;11;12;
--------------------------------------------------------------------
```

See Also   **portcfgnport**, **portcfgnpivport**

Access Gateway system messages

AG-1001

Message

```
<timestamp>, [AG-1001], <sequence-number>,, ERROR, <system-name>,
N_Port <port> is connected to a fabric port that does not support NPIV
```

Probable Cause

Indicates that the fabric port to which Access Gateway is connected does not support NPIV.

Recommended Action

Enable NPIV on the port connected to the Access Gateway using the **portCfgNpivPort** command on the fabric switch. Refer *Fabric OS Command Reference Manual* for more information on this command.

Severity

ERROR

AG-1002

Message

```
<timestamp>, [AG-1002], <sequence-number>,, WARNING, <system-name>,
Unable to find alternate N_Port during fail over for N_Port <port>
```

Probable Cause

Indicates that the F_Ports could not be failed over because no other N_Ports are configured or that the fabric was unstable during the failover attempt.

Recommended Action

Verify whether or not other N_Ports are configured.

If the message persists, run **supportFtp** to set up automatic FTP transfers; then run the **supportSave** command and contact your switch service provider.

Severity

WARNING

AG-1003

Message

```
<timestamp>, [AG-1003], <sequence-number>,, WARNING, <system-name>,
Not able to fail over N_Port <port>. Fail over across different
fabric is not supported.
```

Probable Cause

Indicates that an F_Port could not be failed over to another N_Port because no other N_Ports were connected to the same fabric as N_Port that went offline.

Recommended Action

Connect two or more N_Ports to the same fabric and then enabled failover on these N_Ports using the **ag --failoverenable** command.

Severity   WARNING

AG-1004

Message

```
<timestamp>, [AG-1004], <sequence-number>,, ERROR, <system-name>,
Invalid response to fabric login (FLOGI) request from the fabric for
N_Port <port>.
```

Probable Cause   Indicates that fabric sent an invalid response to FLOGI ELS of the specified N_Port.

Recommended Action   Verify the fabric switch's configuration.

If the message persists, run **supportFtp** to set up automatic FTP transfers; then run the **supportSave** command and contact your switch service provider.

Severity   ERROR

AG-1005

Message

```
<timestamp>, [AG-1005], <sequence-number>,, WARNING, <system-name>,
FDISC response dropped because F_Port <port> is offline.
```

Probable Cause   Indicates that the F_Port which connects to the host is offline.

Recommended Action   Verify the configuration of the host connected to the specified F_Port.

Severity   WARNING

AG-1006

Message

```
<timestamp>, [AG-1006], <sequence-number>,, WARNING, <system-name>,
FLOGI request was not received from F_Port <port>. Port is being
disabled
```

Probable Cause   Indicates that the F_Port which connects to the host did not send FLOGI request for 10 times E_D_TOV. F_Port is disabled.

Recommended Action   Verify the HBA driver configuration of the host connected to the specified F_Port. Access Gateway supports Fabric mode connectivity only.

Check GBIC and other connecting cables and re-enable the F_Port using the **portEnable** command.

Severity   WARNING

AG-1007

Message

```
<timestamp>, [AG-1007], <sequence-number>,, WARNING, <system-name>,
FLOGI response not received for the N_Port <port> connected to
fabric
```

Probable Cause   Indicates the N_Port which is connected to the fabric switch is not online. The N_Port has been disabled.

Recommended Action   Check the connectivity between Access Gateway N_Port and fabric switch port.

Severity   WARNING

AG-1008

Message

```
<timestamp>, [AG-1008], <sequence-number>,, WARNING, <system-name>,
Invalid PLOGI response from the fabric on the N_Port <port>
```

Probable Cause   Indicates that the fabric switch management server did not accept the login (PLOGI) request sent by the Access Gateway from the specified N_Port.

Recommended Action   Verify the configuration on the fabric switch that is connected to the Access Gateway.

If the message persists, run **supportFtp** to set up automatic FTP transfers; then run the **supportSave** command and contact your switch service provider.

Severity   WARNING

AG-1009

Message

```
<timestamp>, [AG-1009], <sequence-number>,, WARNING, <system-name>,
FLOGI sent from  N-Port <port> failed
```

Probable Cause   Indicates that the fabric login (FLOGI) request sent to the fabric switch from the Access Gateway failed.

Recommended Action   Verify the configuration of the fabric switch..

If the message persists, run **supportFtp** (as needed) to set up automatic FTP transfers; then run the **supportSave** command and contact your switch service provider.

Severity   WARNING

AG-1010

Message

```
<timestamp>, [AG-1010], <sequence-number>,, WARNING, <system-name>,
PLOGI sent from  N-Port <port> failed
```

Probable Cause   Indicates an internal problem with the Secure Fabric OS.

Recommended Action   Verify the configuration of the fabric switch..

If the message persists, run **supportFtp** (as needed) to set up automatic FTP transfers; then run the **supportSave** command and contact your switch service provider.

Severity   WARNING

AG-1011

Message

```
<timestamp>, [AG-1011], <sequence-number>,, WARNING, <system-name>,
FDISC sent from N-Port <port> failed
```

Probable Cause   Indicates that the discover F_Port service parameters (FDISC) request sent to the fabric switch from the Access Gateway failed.

Recommended Action   Verify the configuration of the fabric switch..

If the message persists, run **supportFtp** (as needed) to set up automatic FTP transfers; then run the **supportSave** command and contact your switch service provider.

Severity   WARNING

AG-1012

Message

```
<timestamp>, [AG-1012], <sequence-number>,, WARNING, <system-name>,
FDISC sent from N-Port <port> failed
```

Probable Cause   Indicates that the N_Port logout request sent to the fabric switch from the Access Gateway failed.

Recommended Action   Verify the configuration of the fabric switch..

If the message persists, run **supportFtp** (as needed) to set up automatic FTP transfers; then run the **supportSave** command and contact your switch service provider.

Severity   WARNING

AG-1013

Message

```
<timestamp>, [AG-1013], <sequence-number>,, INFO, <system-name>,
Failing over all F_Ports mapped to N_Port <port> to other N_Port(s)
```

Probable Cause   Indicates that the F_Ports were failed over to another N_Port(s) that is connected to the same fabric.

Recommended Action   Run the **ag --mapshow** command to display the updated F-Port to N-Port mapping.

Severity   INFO

AG-1014

Message

```
<timestamp>, [AG-1014], <sequence-number>,, INFO, <system-name>,
Failing back F_Ports to mapped to N_Port <port>
```

Probable Cause   Indicates that the N_Port is back online and the F_Ports have been failed back to the N_Ports to which they were mapped.

Recommended Action   Run the **ag --mapshow** command to display the updated F-Port to N-Port mapping.

Severity   INFO

Index

D

disable
    Access Gateway mode 3-1, 3-3, 3-4
    failback policy 4-8
    failover policy 4-7
    N_Port 4-10
display
    mapping 4-2, 4-3
    status, port 4-4

E

edge switch
    compatibility B-1
    FLOGI 2-1
    long distance mode setting 2-1
    NPIV 2-1
    settings 2-1
enable
    Access Gateway mode 2-2, 2-4, 2-5, 3-4
    failback policy 4-8
    failover policy 4-7
    N_Port mode 4-10
error
    AG-1001 D-5
    AG-1002 D-5
    AG-1003 D-5
    AG-1006 D-6
    AG-1007 D-7
    AG-1008 D-7
    AG-1009 D-7
    AG-1010 D-8
    AG-1011 D-8
    AG-1012 D-8
    AG-1013, D-9
    AG-1014 D-9
    AUTH-1004 D-6
    AUTH-1005 D-6

F

F_Port
    add to an N_Port 4-5
    configuration 4-9
    mapping, example 1-4
    mapping, show 4-2
    remove 4-6
    settings, edge switch 2-1
    status 4-3
fabric
    compatibility 2-1
    inband queries 2-1
    join 3-5
    logins 2-1
    Management Server Platform 2-1
    merge switch 3-5
    settings 2-1
    zoning scheme 2-1
Fabric OS Management Server Platform Service
    settings 2-1
failback policy
    disable 4-8
    enable 4-8
    example 1-6, 1-8
    management 4-7
    overview 1-7
failover policy 1-6
    behavior 1-7
    disable 4-7
    enable 4-7
    example 1-7, 1-8
    management 4-7
FLOGI 1-5

I

inband queries 2-1

J

join fabric 3-5

L

long distance mode, edge switch 2-1

M

mapping
  configuration 4-4
  display 4-2, 4-3
  example 1-4
  ports 1-4
  remove F_Port 4-6
  show 4-2

N

N_Port
  disable 4-10
  F_Port, add 4-5
  F_Port, remove 4-6
  failback, enable 4-8
  failover policy, enable 4-7
  lock 4-10
  mapping 4-4
  mapping example 1-4
  remove F_Port 4-6
  show map 4-2
  status 4-3
  unlock 4-9, 4-10
NPIV
  edge switch 2-1

O

optional features i-4

P

policy
  failback, enable 4-8
  failover, enable 4-7
port
  comparison 1-3
  initialization 1-5
  management 4-1
  mapping 1-4
  requirements B-1
  types 1-2

R

requirements
  edge switch settings 2-1
  fabric settings 2-1
  ports B-1
resources i-3, i-4

S

settings
  ACL policies 2-1
  FLOGI 2-1
  inband queries 2-1
  Management Server Platform 2-1
  zone, no access 3-5
status
  port, display 4-4
  show 4-3
supported hardware and software i-1
switchMode
  Access Gateway mode 2-6
  Native 2-5

T

terms i-3

U

unlock
  N_Port 4-9, 4-10

W

Web Tools
  Access Gateway mode, disable 3-3
  Access Gateway mode, enable 2-2

Z

zoning
    merge 3-5
    schemes 2-1
    setting 3-5